



Gas System Controls

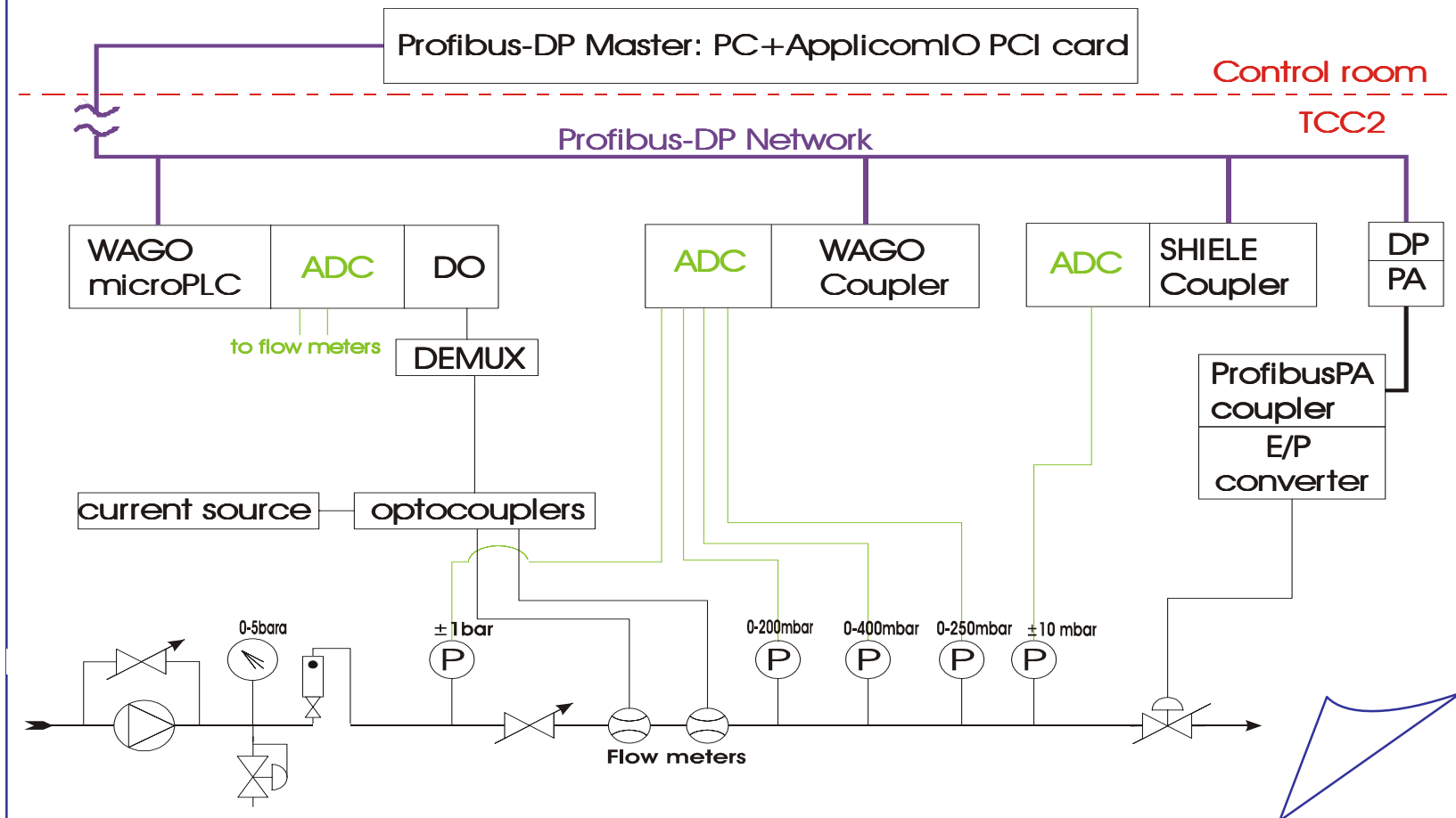
Requirements

- Distribution racks of gas system installed on outer layer of LHC detectors (outside of muons)
- Estimated radiation levels: 0.1 to 1Gray/year
- Components: pressure sensors+analogue control valves, multi-position valves, and channel flow meters (PT100+ electronics+programmable controller)
- Control and monitoring over field-bus: Profibus-DP and/or CANopen



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TEST SETUP





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Pressure Sensors Results

Radiation dose: 80gray/week

Manufacturer	Range	Type	Output	Transducer	Result
JUMO	0-250mbar	Diff.	4-20mA	PIEZO	+ve Drift
JUMO	0-400mbar	Diff.	4-20mA	PIEZO	OK
HAENNI	±1bar	Diff.	4-20mA	PIEZO	-ve Drift
HALSTRUP	0-200mbar	Diff.	0-10V	CAP.	FAIL
SENSORTEC	±10mbar	Diff.	4-20mA	RES.	OK



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Electronic components

Radiation dose: 80gray/week

Manufact.	Component	Description	Part#	Result
AGILENT	Optocoupler	Photodiode	HCPL-2730	OK
NAIS	Optocoupler	MOSFET	AQW210	FAIL
NAIS	Optocoupler	MOSFET	AQY272	FAIL
ISOCOM	Optocoupler	Phototransistor	H11B1	FAIL
Nat.Semic.	Volt Regulator	Adjustable	LM317L	OK
Nat.Semic.	Volt Regulator	Fixed 5V	LM7805	OK
Fairchilde	DeMUX	Analogue MUX	CD4051BC	OK
SIEMENS	I/P positioner	Profi-PA coupler	PS2-PA	OK after reset
Omron	2*PSU	220Vac/24Vdc	S82K	DRIFT
SHIELE	PSU	220Vac/24Vdc	2423-418	FAIL



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Profibus-DP Couplers and PLC

Radiation dose: 80gray/week

Manufact.	Description	Part#	Result
WAGO	Micro-PLC	750-833	FAIL
WAGO	Bus-coupler	750-301	Ok after test
WAGO	ADC	750-476	Ok after test
WAGO	DO	750-519	FAIL
SHIELE	Bus-coupler	2423-422	FAIL(PSU?)
Pepperel + Fuchs	PA/DP converter	KFD2-BR	OK



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Conclusions

- More tests are needed to: refine component selection for pressure sensors and optocouplers, study ELMB solution
- Suitable ProfibusDP coupler with ADC and DO are still required
- First time in TCC2: positive experience
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